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Impact of DC Joule anneal treatment on the high-frequency magnetoimpedance response of Fe-rich FeCo ribbons with varying glass former content TATIANA EGGERS, Department of Physics, University of South Florida, Tampa, FL, ALEX LEARY, MICHAEL MCHENRY, Materials Science and Engineering, Carnegie-Mellon University, Pittsburg, PA, IVAN SKORVANEK, Institute of Experimental Physics, Slovak Academy of Sciences, Kosice, Slovakia, HARIHARAN SRIKANTH, MANH-HUONG PHAN, Department of Physics, University of South Florida, Tampa, FL — The Magnetoimpedance (MI) effect in 2 mm wide $(Fe_{65}Co_{35})_{83.5-x}B_{13}Nb_xSi_2Cu_{1.5}$ rapidly quenched ribbons with varying glass former content(x = 0 and x = 4) has been studied in the frequency range of 1-1000 MHz. Two measurement techniques were used: auto-balancing bridge method in the frequency range of 1-110 MHz and transmission line technique for 20-1000 MHz. The impact of DC Joule heating treatments of varying current amplitude and annealing time on the MI effect of the amorphous ribbons was evaluated by examining the field and frequency dependence on the resistive and reactive components of the MI. To interpret the MI behavior, the domain structure of the ribbons in their as-quenched state and after heating treatment was imaged by magneto-optical Kerr effect microscopy. A significant improvement in the MI response from the as-quenched state was found for both compositions of ribbon with a 3 hour-500 mA Joule anneal treatment. The improvement is attributed to the development of a low anisotropy domain structure longitudinally and at an oblique angle between the longitudinal and transverse directions for the 0% and 4% Nb content, respectively.

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